The Post Carbon Reader Series: Waste

Climate Change, Peak Oil, and the End of Waste

By Bill Sheehan and Helen Spiegelman

About the Author

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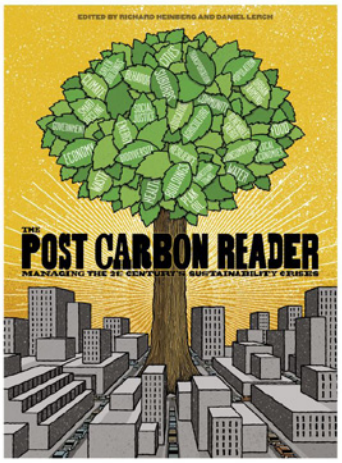

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Waste is supported with services more universal, affordable, and accessible than health care, housing, or education.

Household waste is often overlooked in discussions of big issues like climate change and peak oil. Even dedicated environmentalists sometimes share the prevailing view that waste "will always be with us." In fact, waste as we know it today is not an inevitability but an indicator of massive failure in both markets and market regulation. Worse, we are poised to compound that failure by building costly energy infrastructure that relies on waste as a substitute for declining fossil fuels.

The Normalization of Waste

It's important at the outset to recognize a paradox about waste. Our culture holds generally negative attitudes toward wastefulness, yet waste is supported with community services that are more universal, more affordable, and more accessible than health care, housing, or education. Consider the ubiquitous street litter bins provided and maintained at public expense. These community amenities make wasting easy and convenient. Similarly, household garbage containers lined up at the curb every week communicate unabashedly that *wasting is a publicly sanctioned behavior in our society.*

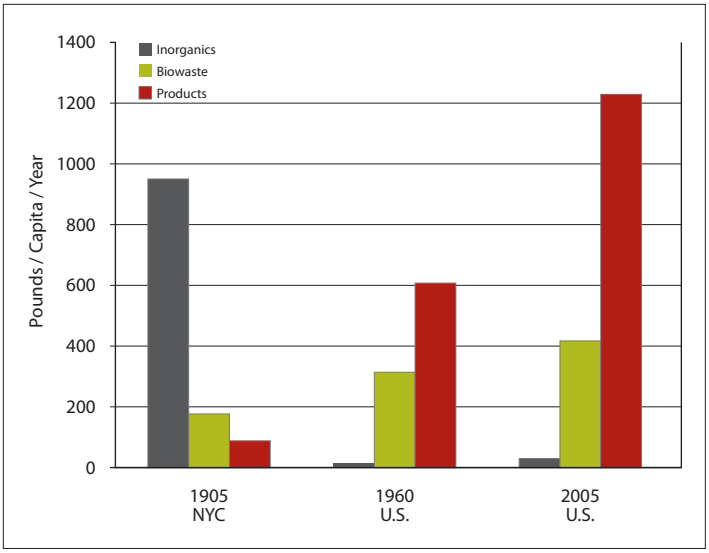
How did wasting become socially normalized to this extent? The answer lies in a well-intentioned effort a century ago to take public action to protect human health and safety.

In the booming industrial cities of the late-nineteenth century "heaps of garbage, rubbish and manure cluttered the streets and alleys," writes waste historian Martin Melosi.[1] Imagine teeming cities where horses were the main mode of local transportation. Pigs and fowl were kept in basements of the crowded tenement buildings that housed the growing numbers of the new laboring class. In such conditions, yellow fever, typhoid, cholera, and other diseases emerged quickly and spread rapidly, affecting neighborhoods both rich and poor.

The only waste collection services were informal arrangements with itinerant entrepreneurs such as rag collectors. As time went by and things got worse, Melosi writes, the traditional notion of individual responsibility for refuse disposal gave way to an acceptance of community responsibility. A broad-based civic reform movement demanded that cities provide "municipal housekeeping" to keep the streets clean. In this way, *waste management* became a core function of our local governments. The streets and alleys were cleansed and, best of all, citizens had the assurance that their waste was safely in the hands of competent professional engineers and public servants.

No one could have predicted what would happen over the next hundred years (figure 28.1). When local governments assumed responsibility for solid waste a century ago, household and commercial waste consisted mainly of inorganics, in the form of coal ash and wood

FIGURE 28.1
Changes in per capita municipal solid waste "generation" by weight



Note: Inorganics = "ashes" (1905), "miscellaneous inorganic wastes" (1960, 2005); Biowaste = "garbage" (1905), "food scraps" plus "yard trimmings" (1960, 2005); Products = "rubbish" (1905), "products" (1960, 2005).

Sources: Helen Spiegelman and Bill Sheehan, *Unintended Consequences: Municipal Waste Management in the Throwaway Society* (Athens, GA: Product Policy Institute, 2005). 1905 data are from Martin V. Melosi, *Garbage in the Cities* (College Station, TX: Texas A&M University, 1981). 1960 and 2005 data are from United States Environmental Protection Agency, "Municipal Solid Waste in the United States: 2005 Facts and Figures," EPA530-R-06-011 (Washington DC, October 2006), page 64, http://www.epa.gov/wastes/nonhaz/municipal/pubs/msw2005.pdf.

BOX 28.1
What Is "Solid Waste"?

The U.S. Environmental Protection Agency (EPA) defines *municipal solid waste* as the materials traditionally managed by municipalities, whether by burning, burying, recycling, or composting.[1] This material is actually a small fraction of the far larger universe of waste created "upstream" of the consumer in the course of extracting raw materials, processing and manufacturing products, and packaging. These industrial-process wastes are called *industrial hazardous waste* and *industrial nonhazardous waste*.

There are three major components of municipal solid waste:
(1) Inorganics (inert material such as ashes, rocks, bricks, etc.).
(2) Food scraps and yard trimmings and other biodegradable wastes.
(3) Manufactured products and their associated packaging.

The EPA uses the term *waste* to refer to all materials managed by municipalities, and the term *discards* is the subset that is buried or burned. To acknowledge the resource value of unwanted materials, we prefer the opposite usage: *Discards* refers to all materials set out, whereas *waste* refers to discards destroyed by burning or burying.

1 U.S. Environmental Protection Agency, *Municipal Solid Waste Generation, Recycling and Disposal in the United States: Facts and Figures for 2007*, EPA-530-R-08-0 1 0 (Washington DC: Government Printing Office, 2008).

ash from furnaces and stoves.[2] Beyond that, waste was mostly food scraps, with a smaller quantity of simple manufactured products made with paper, cloth, and leather. By 1960, the ash had been almost completely eliminated by the introduction of other forms of space heating and cooking appliances, biodegradable wastes had doubled because of suburbanization, and there was already striking evidence of the advent of the throw-away economy. By the year 2005, products and packaging made up 74 percent of our waste and reflected a thirteenfold increase in per capita consumption from one hundred years earlier. The growth in production and consumption is driving waste growth.

Throwaway products and packaging have become a hallmark of modern industrialized economies, eagerly emulated by less industrialized economies. Constant demand for "new" products is actively encouraged, spurred by advertising and planned obsolescence in product design. Historian Susan Strasser has noted that the mass-marketing of consumer goods started as long ago as catalog sales in the nineteenth century, and that advertising campaigns had to be developed to replace established values of thrift with new values of conspicuous consumption.[3] Consumerism and planned obsolescence became even more entrenched after World War II when the development of the national highway system increased the mobility of people and goods, encouraging the proliferation of convenient disposable products and packaging. Note in figure 28.1 that between 1960 and 2005 per capita product and packaging discards doubled while the per capita generation of organic discards like food scraps and yard trimmings remained relatively constant (yards and stomachs have natural limits, while desire for new stuff is seemingly limitless). Today we think nothing of consuming and

discarding thirteen times more manufactured goods than our great-grandparents did.

Product and packaging waste grew not only in quantity but also in toxicity. As petroleum production expanded in the twentieth century to power a growing fleet of motor vehicles, cheap petrochemical byproducts became the building blocks for whole new classes of products and packaging. Plastics were novelties in the 1930s but their use virtually exploded after World War II and has experienced continued growth ever since. Moreover, whole new classes of other synthetic chemicals based on petroleum—the vast majority untested for toxic effects on human health and the environment—proliferated during this period, and they continue to be invented and used in products and packaging at an ever-increasing rate. While much has been done to reduce and regulate releases of chemicals during industrial production, many of the more than 80,000 synthetic chemicals produced in commercial quantities wind up in products and packaging and are released during the use and disposal of the products containing them, posing risk not only to public health and safety but to the global ecosystem.[4]

The Throwaway Economy and Climate Change

The stuff we buy, use, and discard has a long and complicated life story. The waste we discard at the curb is only a fraction of the total waste produced along the way. Annie Leonard sums it all up in a fast-paced, twenty-minute blockbuster Web film called *The Story of Stuff*.[5] Raw materials are gouged from nature, manufactured into packaged products by underpaid workers, shipped halfway around the world to rich countries, sold in "big-box" stores, and, more often than not, deposited in huge industrial-scale landfills and incinerators. The average life span of the materials used in manufactured goods and packaging, according to Leonard's sources, is six months.

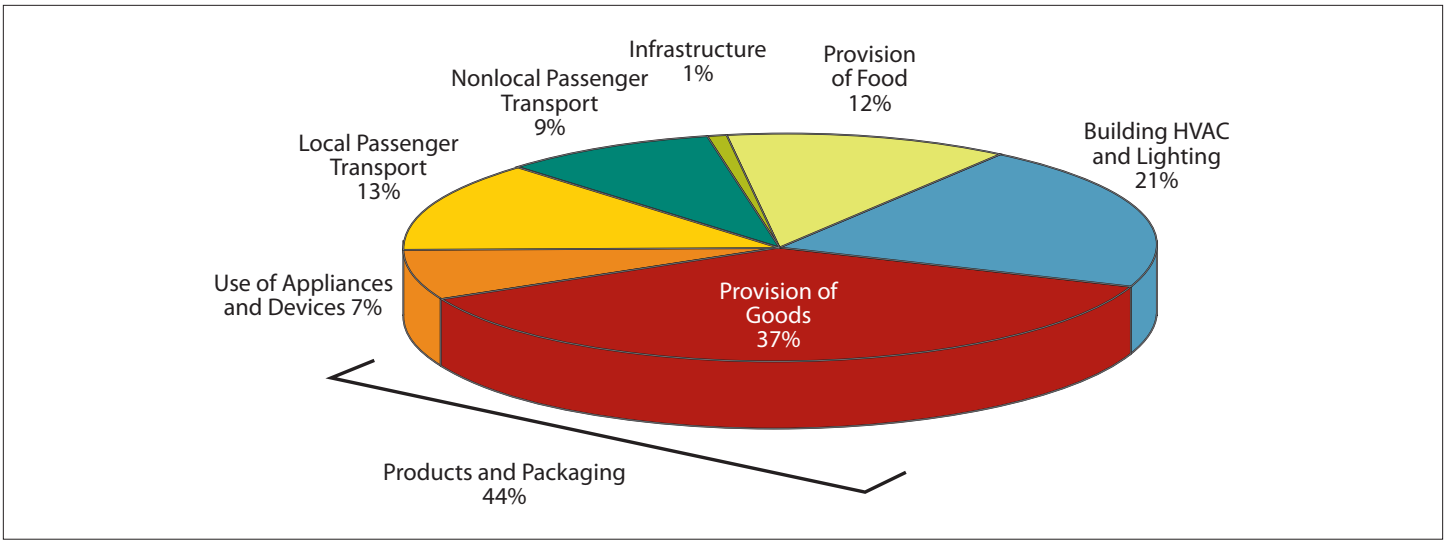
The greatest impacts from our consumption happen to someone else, somewhere else. We don't see the pollution, depleted resources, and social ills in the distant communities that supply our stuff. And because our waste is increasingly hauled longer and longer distances to massive disposal facilities, we don't see the impacts where our waste ends up. In short, the "distancing" of the pleasurable consumption experience from both production and wasting insulates us from the consequences of our actions.[6] But new analytical tools are making it possible to quantify the upstream and downstream impacts of the products we buy and use.

Ecological footprint analysis, developed by Canadian researchers William Rees and Mathis Wackernagel in the 1990s,[7] provides a measure of the global scale of our resource consumption. It shows us that North American consumption requires resources from an area four times greater than what our actual land-based biological carrying capacity can support. We are able to enjoy this extra consumption (temporarily) because we *appropriate the carrying capacity* of other parts of the world. We are, every day, throwing away other people's shares of limited global resources to supply our wants and needs. Furthermore, global per capita consumption of some commodities has grown eight to twelve times faster than population over the past four decades.[8]

We have yet to come to grips with our own vulnerability in this global supply system. We in rich countries have almost lost the ability to supply our own needs through local manufacturing and agriculture—or even to extend the life of products through reuse, repair, and repurposing. We rely on others, and on a system lubricated by cheap oil, to meet our needs as well as our wants. In the post-peak-oil period, inevitable interruptions in the flow of the goods we rely on every day will be profoundly destabilizing.

It turns out that our throwaway economy is also a major contributor to climate change. The U.S. Environmental Protection Agency (EPA) released a report in September 2009 that shines new light on the greenhouse gas impacts of "stuff" bought and thrown

FIGURE 28.2
Consumption-based view of sources of U.S. greenhouse gas emissions, 2007, including emissions from products made abroad and consumed in the United States.



Source: Joshuah Stolaroff, *Products, Packaging and U.S. Greenhouse Gas Emissions* (Athens, GA: Product Policy Institute, September 2009).

away by Americans.[9] Conventional greenhouse gas analysis apportions emissions based on industrial sectors—electricity, transportation, and so on. This EPA report instead used life-cycle analysis to incorporate all of the emissions associated with end-user materials and energy that are consumed, in the economists' sense, by households and governments. In this new systems-based analysis (also known as consumption-based analysis),[10] we can quantify the greenhouse gas emissions that are embodied in the goods we buy and use.[11] These include the energy used at all stages of the product life cycle: to extract and process the resources, to manufacture and transport the products, to operate the retail outlets, to use the products themselves, and then to dispose of them by recycling, burying in landfills, or burning in incinerators.

The EPA report concluded that the provision of goods and materials is responsible for the largest share, by far, of *direct* U.S. greenhouse gas emissions. The Product Policy Institute commissioned a supplementary white paper by the technical author who wrote the EPA report to factor in *indirect global* emissions—that is, the emissions from products produced abroad and consumed in the United States minus products produced here and shipped abroad.[12] The white paper showed that 44 percent of total U.S. greenhouse gas impacts are due to the provision, use, and disposal of products and packaging (figure 28.2). That's more than the emissions from the energy used in buildings, passenger transportation, or the provision of food—activities that get the lion's share of attention in government and business efforts to reduce greenhouse gas emissions.

We cannot address climate change or prepare for the post-peak-oil period without changing the way we manage products and packaging throughout their life cycles. And since previous research has shown that most impacts occur in the production stage[13]—and thus are determined at the design phase—policies are needed that address how products are designed and marketed to encourage conservation and recycling. These policies should be a part of every state and local government's climate action plan. But our waste management policies are having the exact opposite effect.

Market Failure

Many of the social and environmental problems we face today can be traced to market failure, often occurring as an unintended consequence of well-intentioned public policy. This is the case with waste. Much of the stuff

we throw away cannot be recycled, reused, or repaired because it was designed to be wasted. The waste management system supports planned obsolescence by providing the convenient removal and disposal of all those poorly designed products and their associated packaging.

Because of our waste policy, it is local communities—not the producers of throwaway products and packaging—that bear the cost of cleaning up after the throwaway economy. Over the course of the twentieth century, taxpayers and ratepayers have faced higher and higher costs to manage more and more waste.

On top of the direct financial costs, we must also factor in the *opportunity costs* of allocating more and more public dollars to waste management instead of to other essential community services like public safety, schools, libraries, and parks. And then there are the hidden social, economic, and environmental costs imposed on the communities (usually poor) and ecosystems where our stuff is produced and where our waste is sent. Economists call these *externalized costs,* because they fall on someone other than the producers and consumers who directly benefit from the products.

The externalization of costs leads to what economists call *market failure*. The market's "invisible hand" pushes us toward choices that are underpriced because they don't factor in the externalized costs. If the market had been working correctly, the real costs of wasteful products would long ago have given producers and consumers clear feedback telling them to produce less waste. But because our cities and towns provided the programs to clean up after the throwaway economy at taxpayer or ratepayer expense, this critical feedback loop was broken. In this way, our communities have become unwitting enablers of the market's turn to massive scales of excess production and consumption.

Horse-drawn garbage wagon in Seattle, 1915.

Supersizing Municipal Waste Management

As waste grew over time, so did the waste management system. From its humble beginnings of horse-drawn carts and dumps at the edge of town, waste management has grown into a multibillion-dollar, multinational industry that hauls local garbage to huge disposal facilities that are sometimes hundreds or even thousands of miles away.[14] The municipal waste management system is made up of both public entities (municipal waste authorities) and private-sector waste management companies. This complex waste management system has evolved its own regulatory, administrative, technological, market, and social components, which operate largely out of the view of ordinary citizens and with loose oversight by local elected officials, who generally defer to the expertise of their professional staff when it comes to decisions about waste.[15]

By the middle of the twentieth century, impacts arising from the growing volume and toxicity of municipal waste had begun to rouse public concern. State and federal governments started to intervene in municipal waste management, forcing the cleanup of former landfill sites (one-fifth of all the federal-designated "Superfund"

hazardous waste sites in the United States are old municipal landfills) and imposing new guidelines on the operation of landfills and incinerators.[16] By the late 1980s government regulations were forcing the closure of hundreds of municipal landfills across North America—resulting in further unintended consequences.

The closure of local dumps, along with the ever-rising quantities of waste (the amount of waste flowing to U.S. landfills grew by more than 70 percent between 1960 and 1990[17]), created a perceived "landfill crisis," which in turn created a growth opportunity for the private waste management industry. The waste industry consolidated, with a handful of publicly traded waste corporations buying up thousands of small companies that used to serve their local communities. During this period, the corporate "Giants of Garbage" built huge regional landfills serving many municipalities.[18] This eliminated the landfill shortage and indeed created an abundant supply of disposal capacity that kept disposal costs relatively low, despite the extra cost of long-distance hauling.[19]

The period between 1980 and 1990 also saw hundreds of proposals to solve the landfill "crisis" by building waste incinerators, and these received strong encouragement from the federal government.[20] A new movement of citizen reformers sprang up and battled proposals for waste incinerators in their communities. The citizens called instead for municipal recycling programs to conserve the valuable resources in the waste stream. Like their Progressive Era predecessors, these activists left a lasting mark on municipal waste management. Almost three hundred incinerator proposals were shelved and the waste industry was forced to adapt to the changing political climate.

The response was a new waste management policy called integrated waste management (IWM). IWM is based on a hierarchy of preferred management strategies: reduce, reuse, recycle, and, last, bury or burn. This policy approach was sanctioned by senior levels of government including the EPA.[21] To reinforce the hierarchy, more than two dozen U.S. states and several Canadian provinces required local governments to meet recycling or waste "diversion" targets, diverting waste from landfills and incinerators into local recycling or composting programs. The State of California passed legislation in 1989 requiring cities to divert half of their waste by the year 2000 or face stiff fines.[22]

In practice, IWM settled for what was deemed to be an "optimal mix" of traditional disposal in landfills and incinerators operating alongside recycling and composting programs. After three decades of effort and a huge public investment in recycling infrastructure, the national diversion rate for municipal solid waste reached barely 33 percent in the United States and 22 percent in Canada.[23] In other words, despite the hierarchy of preferred options, the large majority of discards are still being entombed and destroyed in landfills and incinerators. The lion's share of solid waste department budgets and waste industry profits are in waste disposal, rather than in the "three Rs" (reduction, reuse, and recycling).[24] Most important, in the broader context of global material flows, waste continues to grow. New York University writer Samantha MacBride comments:

> Using metrics of tons flowing globally and ending in waste, rather than the vibrancy of the recycling industry or the popularity of recycling, it is fair to say that solid waste solutions practiced in the U.S. today are not achieving outcomes in a materially meaningful way. [25]

IWM has had no discernible effect on production and consumption because these occur outside the scope of the end-of-pipe waste management system. Indeed, gains achieved by municipal recycling programs have been offset by continuing growth in both consumption and population. Even with recycling programs in place, cities in the United States and Canada are sending more waste to landfills and incinerators today than they did in 1990.[26] Municipal waste managers do their planning around the assumption that waste will continue to grow over time; thus they tend to favor continued expansion of waste facility infrastructure to accommodate that growth.[27]

Communities that invest in incinerators become locked into supplying those facilities with waste, a vicious cycle that shuts out waste reduction.

Garbage Rebranded as Fuel: Wasted Energy

Conceding that IWM is incapable of significant further progress on waste reduction, the waste industry is now shifting its focus to brand garbage as a renewable energy source.

INCINERATORS—BURNING THE FURNITURE TO HEAT THE HOUSE

The incineration industry is exploiting concern about the declining supply of fossil fuels to create a growth opportunity for waste incineration. Co-opting the language of the citizen reformers who battled incinerators in the 1980s, incinerator salespeople tell municipal officials that waste is a "resource." A ton of garbage, says global incineration giant Covanta Energy, contains the energy equivalent of a barrel of oil or a quarter ton of coal.[28]

Municipal officials desperate for a positive solution have been convinced. The chair of Metro Vancouver's waste committee tells his constituents that sending a million tons of garbage to landfills is like "burying a million barrels of oil in the ground every year."[29]

Less attention is paid by busy politicians to the counterargument posed by economist Jeffrey Morris. Using systems-based life-cycle analysis like that of the U.S. EPA report cited above, Morris points out that one ton of garbage actually represents the equivalent of *eight barrels of oil* that were used during the manufacture, distribution, sale, use, and disposal of the products and packaging in the waste.[30] Thus, burning mixed garbage in waste-to-energy plants still results in a net energy *deficit* of seven barrels of oil (equivalent) per ton of garbage. Reuse and recycling preserves much more of the embodied energy value than any form of waste disposal, which is a complete, or nearly complete, write-off of all the investment of resources and energy that was used to produce the products.

The illusion that garbage is a renewable fuel ignores the fact that our cities don't produce the materials in their waste. A city is an open system; products and packaging flow in from somewhere else. This creates the politically challenging problem that a local community burning its waste receives economic benefits (heat and power generation, avoided cost of landfilling), whereas the distant communities where replacement products are manufactured are burdened with social and environmental costs (resource extraction, factory and transportation pollution). Politicians naturally favor a course of action that benefits their own constituencies. Nevertheless, communities that invest in waste incinerators become locked into supplying those facilities with waste in order to earn the energy revenues on which the economic viability of waste-to-energy depends. It's a vicious cycle that shuts out waste reduction. Where is

the incentive to produce or consume reusable and recyclable products if the energy infrastructure relies on throwaways to operate?

LANDFILLS—A MAJOR SOURCE OF UNCONTROLLED GREENHOUSE GAS EMISSIONS

It's not just the incineration industry that is on board the waste-to-energy bandwagon. Landfill operators are trying to exploit the gas that is produced by decomposition of the organic fraction of garbage, which includes paper, food scraps, and yard trimmings.[31]

Methane is generated in landfills and open dumps as waste decomposes without oxygen; landfill gas contains about 50 percent methane, which can be combusted as a fuel. This may seem like a smart use of our otherwise useless landfills, but it can also create incentives for decisions that are not so smart. For example, in late 2009 the state of Michigan, which banned yard waste from landfills a generation ago, was pressured by the landfill industry to repeal the yard-waste ban so they can "convert grass to gas."[32] Similarly, the waste industry is seeking to reverse long-standing practices that were put in place to delay landfill gas generation and introduce practices to *speed up* the production of landfill gas for use as fuel. Unfortunately, adding more organic matter to our landfills will also increase the rate at which they fill up, meaning local governments will need to spend more money and sooner to build new landfills (usually farther away).

More important, while landfill-generated methane is a potential energy source, it's also a potentially devastating greenhouse gas, and gas capture systems are far from perfect. Methane is twenty-three to seventy-five times more potent than carbon dioxide, depending on the timescale over which it is measured.[33] Landfills are the second-largest human-related source of methane in the United States, accounting for 23 percent of all methane emissions in 2007.[34] When actual operating conditions are taken into account over the lifetime of a landfill, even with gas-recovery systems in place as much as 80 percent of the methane may still end up

being released into the atmosphere.[35] As a recent Sierra Club report on landfill gas-to-energy practices states:

> Contrary to conventional wisdom, it appears the relatively small carbon dioxide reduction benefit that might be achieved by replacing fossil fuel electricity with electricity [generated from landfill gas] is greatly outweighed by the increase in fugitive methane emissions resulting from altered landfill management practices.[36]

Finally, landfill gas does not burn cleanly—some studies suggest dioxin emissions from landfill gas flaring are thirty times higher than from state-of-the-art waste incinerators.[37] Whether from incinerators or landfills, the risk to human health from waste combustion, despite advances in pollution control, is far from zero. Along with the well-known effects of dioxins and heavy metals in incinerator emissions, there are new and less well-characterized threats to health from nanoparticles that can move through tissues into the brain.[38] And in the end, landfilling, like incineration, removes products from circulation so that the destructive production process must be repeated again and again.

The European Union introduced tough measures in 1999 for reducing the quantity of biodegradable materials going into landfills in order to prevent methane emissions.[39] But Europe's approach had the unintended consequence of encouraging waste incineration with its

own attendant greenhouse gas impacts. North America is in a position to learn from European experience by rejecting end-of-pipe solutions and emphasizing prevention.

The Zero-Waste Vision

Our waste management policies and practices rest on the assumption that waste is inevitable—an assumption that became a self-fulfilling prophecy. What if we start from the assumption that most, if not all, of the waste in our communities is a symptom of massive market failure caused by misguided (if well-intentioned) policies? Once we accept this assumption, we are well on the way toward *denormalizing waste*.

Zero waste is an approach directed at preventing waste rather than managing it. Its scope is the entire production and consumption system, not just the back-end activities of our economy that have traditionally been carried out by local governments and the waste industry. It is a holistic focus on global resource flows, rather than a myopic focus on local waste management. Zero waste is the design principle best articulated by William McDonough and Michael Braungart in their 2002 book *Cradle to Cradle:* Instead of "cradle-to-grave" resource flows, zero-waste design produces safe products and closed-loop "cradle-to-cradle" flows.[40]

THE COMMUNITY'S RESPONSIBILITY

Strong federal and even international regulation will be required to reduce today's unsustainable global materials and energy flows and to channel them into closed-loop systems where wasting is discouraged. But change can be driven from the local level, through a conscious rethinking by citizens about the role of their local communities in the global system of producing and discarding goods.

Zero waste offers communities a practical alternative to IWM, a strategy to begin correcting decades of neglect both at the front (production) and back (disposal) ends of our throwaway economy. The Product Policy Institute proposed in 2005 that communities focus on two zero-waste objectives that should be pursued together.[41] The first is eliminating the municipal subsidy that communities provide to producers of throwaway products and packaging, which is enabling waste growth. The second is curbing the emission of methane and other harmful substances caused by landfilling of organic wastes. This is an area where local communities can take immediate action. The need is urgent in North America because more than 80 percent of our waste that is buried or burned ends up in landfills.[42]

Local governments in North America have already had striking success diverting yard trimmings from landfills. Within a decade of introduction, yard trimmings diversion programs were recovering almost two-thirds of available supply.[43] Food and food-contaminated paper products remain the unfinished business of our municipal recycling system.[44] Less than 3 percent of food scraps (which comprise 20 percent of the discards in landfills) are currently being diverted; fortunately, major cities in the United States have recently begun collection of food scraps.[45] In October 2009, San Francisco became the first city in the United States to require residents and businesses to separate organic material from their waste. Seattle has a similar requirement that applies only to single-family homes. The Canadian province of Quebec, with federal government support, is investing over $500 million in four new municipal composting infrastructure projects to divert organics from disposal.[46]

THE PRODUCER'S RESPONSIBILITY

The other great task of local communities is to give back to producers and consumers the responsibility for the management of throwaway products and packaging. This is being done through an internationally recognized policy called "extended producer responsibility" (EPR), also known as "product stewardship" in North America.[47] EPR establishes a legal chain

Recycling programs simply deliver low-value commodities back into the global marketplace, with the municipality taking the risk of fluctuating market prices.

of producer custody extending through the entire product life cycle.

Ultimately, there could be a significant reduction in the overall flows of materials and energy if producers rethink their products and supply chains to avoid the costs that are currently incurred in waste management. Indeed, we are already seeing rapid development of new recycling services where EPR has been introduced. In Canada every province has adopted EPR legislation, and this has given rise to a whole range of new programs provided at no cost to local communities for recycling electronics, tires, used oil, paint, solvents, pesticides, pharmaceuticals, and beverage containers.[48]

An early precursor to the system we now call EPR was the system used in the first half of the twentieth century for marketing nationally branded soft drinks and beer. At one time, every town had several bottling plants. These were local businesses that would produce one or more brand-name beverages using syrup concentrates that were supplied by the brand owner. The bottlers would package the beverages using distinctive bottles and caps that were also specified by the brand owner; consumers received cash refunds for bringing their bottles back to the store.

But this system was abandoned in the mid-twentieth century due to another well-meaning government program that had unintended consequences. The Interstate Highway System, construction of which began in the 1950s, made it more profitable for the brand owners to switch to no-deposit, no-return bottles and cans that could be filled at large regional bottling plants and trucked on the new highways to local markets. The results were roadside litter, growing quantities of throwaway bottles and cans in local landfills, and the loss of many small bottling businesses as well as small local brands of beer and soft drinks (which used to compete successfully against national brands).

Our municipal recycling programs, at their best, do no more than deliver bales of low-value commodities back into the global marketplace, with the municipality taking the risk of fluctuating market prices. Since the 1970s some state and provincial governments have introduced "bottle bills" requiring beer and soft drink companies to reinstitute cash refunds on bottle and can returns, shifting the cost of beverage container recycling from the public to the beverage industry. These states have the best recycling rates for beverage containers in North America.[49]

This example hints at the possibilities for renewed local economic development through EPR. Local bottling businesses have not yet made a comeback in bottle bill states. However, a return to local production could ensue as energy prices rise post–peak oil because EPR levels the playing field between national brands and local brands. Moreover, EPR not only can help put the

brakes on waste and global materials and energy flows, it can also drive the development of more economically productive manufacturing, repair, and recycling infrastructure in local communities.

THE ACTIVIST'S RESPONSIBILITY

The zero-waste concept has energized a new generation of community activists across North America and beyond. A number of broad citizen-based campaigns are pushing for EPR and programs to divert organics from landfills.

In 2008 the Institute for Local Self-Reliance, the Global Alliance for Incinerator Alternatives, and Eco-Cycle produced a seminal report, *Stop Trashing the Climate*, which examined the link between reform of the waste management system and broader issues of peak oil, climate change, and corporate globalization.[50] The report called for an end to new investment in landfills and incinerators and the expansion of EPR and local recycling. Similarly, the Sierra Club adopted a zero-waste policy in 2008 promoting EPR.[51] COOL 2012 is a new and growing campaign to keep "compostable organics out of landfills."[52]

In addition, the Electronics TakeBack Coalition, the Texas Campaign for the Environment, and other state-level advocacy groups have pressed nineteen states to adopt tough EPR legislation targeted at electronic products. The Container Recycling Institute and ad hoc groups in communities across North America are putting pressure on high-profile beverage producers to expand bottle bills, scoring one new program in the United States (Hawaii in 2002) and significant expansion of the scope of bottle bills in other jurisdictions. Eight out of ten Canadian provinces have bottle bills that are much broader in scope than those in the United States (for example, the province of Alberta requires cash refunds on *all* beverage containers, including milk containers).

Local governments are also increasingly activist in their call for EPR. The Product Policy Institute has organized

local governments to press for state EPR legislation, building on the effective model of the Northwest Product Stewardship Council. That regional council of local governments, established in 1998, lobbied successfully for legislation introduced in Washington State in 2006 requiring producers to set up recycling programs for electronic products. Product Stewardship Councils have been formed in California, New York, Texas, and Vermont and organizing is continuing in other states. The councils have adopted common "framework principles" for product stewardship policy, and they are promoting these as the basis for harmonized statewide legislation.[53]

Government and the Market

A citizens' movement, supported by growing advocacy from local governments, is pressing for change in our waste policy. But national policy is still shaped by the dominant neoconservative economic paradigm that the market economy is the life force of our civilization and that *consumption* is the purpose of that economy, creating jobs and wealth and material prosperity. It also holds that producers will act for the common good once they are guided by "sovereign" consumers without interference from government. By this thinking, if we just

exhort *individual consumers* to purchase green products we will eventually arrive at a greener form of capitalism.

There is some truth within this notion, but there are also the practical realities of corporate power and self-interest. Corporations by nature seek freedom to pursue profit for their shareholders as their first priority, and to keep environmental and other nonmarket obligations to a minimum. Author Samantha MacBride is concerned that the recycling movement is being co-opted by corporations.[54] As an example, these corporations have insinuated themselves into Keep America Beautiful (KAB), a supposedly grassroots organization that promotes entirely nonmarket solutions—volunteer cleanups and municipal recycling—to our waste problem. KAB's most prominent donors ("social responsibility partners") are a garbage company (Waste Management), an opponent of bottle bills (Pepsico), and a major source of cigarette butt litter (Philip Morris).[55] The lower tiers of corporate sponsorship are populated by a "who's who" of the corporations enjoying the greatest subsidies from municipal taxpayers in avoiding their waste management responsibilities. These corporations spare no expense in an effort to build public acceptance of status quo municipal recycling as an initiative that satisfies public yearning for change while not threatening the practices that have led to excessive production, consumption, and waste.

Added to this is the distrust of government that pervades North America at both ends of the political spectrum. The Right trusts corporations more than governments to ensure that we will continue to enjoy the material benefits to which some have become accustomed, while the Left blames governments for decades of inaction against self-interested corporations. This has led especially in the United States to a tolerance of corporate greenwashing rather than tough, fair government regulation.

But there seems to be a growing realization, expressed by Michael Maniates in *Confronting Consumption*, that today's market failure can be addressed effectively only through civic reform rather than voluntary solutions ("collective citizen action as opposed to individual consumer behavior"). To redirect the market toward practices that protect the common good, Maniates emphasizes, we will need "strong and sustained intervention at large scales to regulate the freedom of the firms that control extraction, production and distribution of goods that end up as waste."[56]

Along with the Product Stewardship Councils' advocacy of framework EPR legislation, the Institute for Local Self-Reliance is leading a comprehensive New Rules Project that explores ways of "designing rules as if community matters."[57] Their work in municipal waste management is a good starting place to find examples of interventions at all levels to change the status quo and hold corporations accountable for their waste.

New Rules, New Path

Reforming waste policy is an important part of the broader work on transitioning to a post-carbon economy, both to reduce materials and energy flows and to build resilient communities through a return to local production and product stewardship. It would be irrational to repeat the mistakes of the nineteenth century with public investment in municipal incinerators and landfills supporting unsustainable flows of materials and energy, and simply hope that consumers and producers will of their own accord do in this new century what they failed to do in the last one. Instead, we can set new rules and hold producers responsible for obeying them. If we get waste policy right, we can leverage profound changes in how our society manages materials and energy and how we function as communities. If we fail, then "business as usual" will lead to further acceleration of material and energy throughput and ensuing destabilization of the climate and human society.

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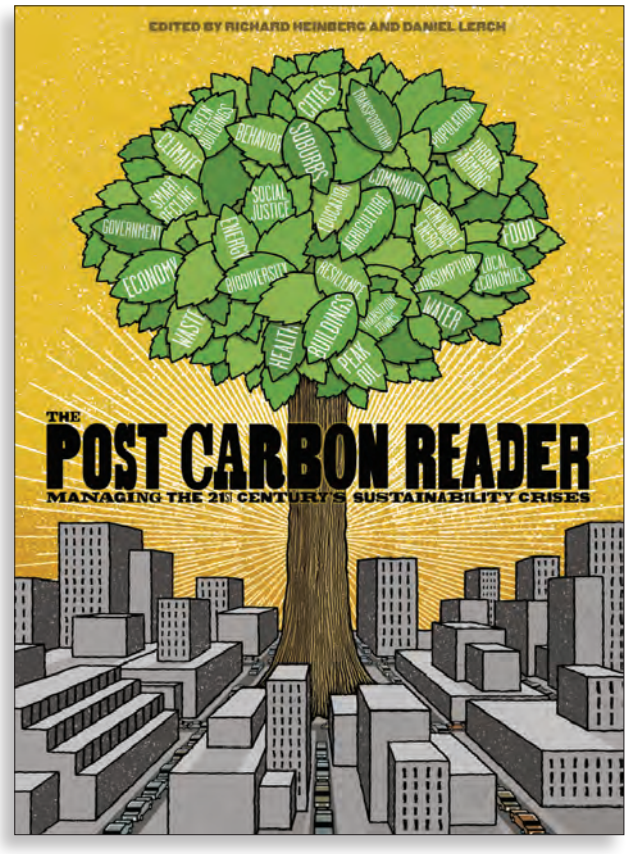

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